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ABSTRACT

One of nine brief guides for special educators on using computer technology, this guide focuses on the selection of software for use in the special education classroom. Four types of software used for computer assisted instruction are briefly described: tutorials; drill and practice; educational games; and simulations. The increasing use of tool software systems (word processing, spreadsheet, and database systems) in educational settings is noted. An educational value is also seen in arcade and adventure games, which may be modified if necessary to increase their accessibility to students with disabilities. Specific criteria for evaluating software are offered in the areas of content, demands on the learner, instructional presentation, technical features, and documentation and management features. Four periodicals which regularly review software, six resources for public domain software, and six directories of software are listed. (DB)

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Center for Special Education Technology

Tech Use Guide

Using Computer Technology

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Selecting Software

Microcomputer use in the special education classroom largely depends on the software selected. Software can introduce new skills and concepts, reinforce previously learned skills, or require the learner to apply new skills and knowledge to a task or problem. Four types of software are used for computer-assisted instruction (CAI): tutorial, drill and practice, simulation, and educational games. In addition, tool software and arcade games may also be beneficial for learners with disabilities.

Tutorials

Educational programs that introduce new skills, concepts, or processes are called tutorials. It is assumed that the learner has little prior instruction in the program's content, therefore, the software is designed to bear the full task of instruction.

For many special education students, the way in which new skills are presented is important to subsequent mastery. The decision to use tutorials to introduce new material in an individualized learning situation should be weighed carefully. If the learner is not supervised, the information may be misunderstood or learned incorrectly.

Although the intent of a tutorial is to provide initial basic instruction to an individual learner, the software can be used in other ways. One variation is to prepare students for the content before using the software. The software is then used to reinforce information introduced by the teacher. Tutorials can also be used effectively in small group situations.

Drill and Practice

Drill and practice is the most common format for educational software, accounting for 50% to 60% of all commercially developed programs. In drill and practice it is assumed that the learner has been introduced to the content before using the software.

Most drill and practice software programs present an item, require a response from the learner, and provide feedback to the learner's response. Because drill and practice involves repetition of facts or problems, items are generally varied so the learner doesn't become bored or simply memorize the content.

The availability of drill and practice software designed for special education students is somewhat limited. Teachers may want to consider software designed for general education. In either case, the key is to carefully review the software to make sure it meets the needs of target learners. Another factor to consider is the scope of skills included in the software. Ideally, the content will be varied enough to be useful with several learners over a period of time.

Educational Games

Computer games generally involve a contest where the child competes with the program or with another player. A game has a clearly defined goal or outcome and is governed by a set of rules. Constraints, such as time limits or number of trials, are usually incorporated into the software. For an educational game to be considered a problem-solving activity, there must be clear, content-related objectives. The program should involve a series of related tasks and alternative solutions for reaching a predefined outcome. Because they are based on objectives, game-playing activities can be readily integrated into the curriculum.

Simulations

Programs that place learners in real life situations are called simulations. Computer-based simulations present situations that are too difficult, dangerous, or costly to recreate or experience firsthand. Aspects of the original situation are replicated and the learner has an opportunity to create or analyze variations of a problem. The learner uses a combination of basic and problem-solving skills to complete the exercise. Principles such as cause and effect, chance, influence, and logic are often involved in the process. There is usually no right answer in a simulation, but different solutions and consequences depending on the choices made by the learner.

Tool Software

Educational Tools. The use of content-free software in educational settings is on the increase. Tool software can be used to find, organize, and present information. Word processing programs are the most popular tools. They allow students to write and revise stories and even publish their own books. Other tool software includes spreadsheet systems and database creation systems.

Administrative/Management Tools. Computers are used to manage special education programs and monitor student progress. Computer software can be used to write

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individual educational plans (IEPs). To do this, special educators either select goals and objectives from their district's database of items or create custom items for a particular child. Computer software can also be used to administer diagnostic tests and track instructional progress through an electronic grade book.

Arcade and Adventure Games

Teachers have found that fantasy video games have a positive educational value. In many instances, once a student succeeds in an adventure game, s/he also begins succeeding in other areas. Working with a computer game quickly motivates children to learn to follow directions. They discover a self-directed learning process and gain confidence in their ability to make choices and control outcomes. The nonjudgmental, immediate reinforcement techniques of computer games make it easier for children to accept their "mistake" and to strive to make "correct" choices next time.

Although many potentially useful games are too difficult to comprehend or physically difficult to manipulate for certain students, modifying the game's level of difficulty and the use of adaptive devices can make video games more accessible. Game designers are now beginning to explore such possibilities and to develop video games for use by students with disabilities.

Criteria for Purchasing Software

Most educators have established criteria to guide decisions about software. These criteria can be organized by a series of questions in five categories: content, demands placed on the learner, instructional presentation, technical features, and documentation and management features. Questions, like the ones below, will help in reviewing software in relation to the skills and capabilities of the target learners.

Content. Materials must be clear and accurate, and should be grammatically and factually correct. Consider the following questions:

- Are the instructional objectives clearly stated?
- Does the content correspond to the learning objectives set for the student?
- Is the content presented in clear, sequential steps?
- Is the program free from stereotypes?
- Does it portray the world accurately?
- Will the program meet the instructional goals of several students?

Demands on the Learner. The cognitive and physical demands placed on learners with disabilities should be given careful consideration. Cognitive demands, such as reading and vocabulary level, may be more critical when selecting software for some special education students, while physical demands may distract from or interfere with learning. The standard computer system may present barriers to effective learning for students with physical or sensory impairments. These barriers can often be modified or bypassed with the use of alternative input or output devices. Consider the following questions:

- What academic demands are placed on the learner?
- Are the number of concepts and variables presented appropriate for the ability of the learner?
- Is the required reading reduced to an essential minimum?
- What sequential memory skills are required?
- What physical demands are placed on the learner?
- Can the software be used with modified equipment?
- Is the size of the print appropriate?
- Is the response time long enough?

Instructional Presentation. The presentation of instructional content is crucial to the mastery of skills and concepts for many learners with disabilities. When reviewing software for instructional presentation, directions to the learner, sequencing of instruction or branching, user control, and feedback provisions should be considered. Well designed software will be highly interactive, incorporating student responses into the instructional sequence. Consider the following questions:

- Is the courseware user friendly?
- Are the instructions sufficient for the student to operate the program independently?
- Does the signaling system (arrow, flashing cursor) stay on the screen as long as needed?
- Does the user control entry, exit, and movement within the program?
- Are modifications of data, speed, or word lists possible by the user? By the instructor?
- Can the user choose from levels of difficulty?
- Does the program move to easier or more difficult material in response to student performance?
- Does the program only repeat the same material if the learner responds incorrectly?
- Is the feedback confusing or distracting?

Technical Features. The technical features of a program include screen formatting, use of animation and graphics, and error handling. If the computer's technical features are not well used, the capabilities may interfere with the presentation of content or distract from learning. Consider the following questions:

- Is the screen format consistent throughout the program?

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- Are graphics, color, and sound used to enhance rather than detract from the content?
- How does the program handle incorrect responses?
- Does it accept alternative or creative responses?
- Is the program tolerant of keyboard misuse?
- Is the software free of programming errors?

Documentation and Management Features. Evidence suggests that high levels of student engagement in front of the computer don't necessarily imply high levels of accuracy. Teachers must carefully supervise the interaction between the student and the software. A good way to monitor student progress is to use a program that collects information about learning as it occurs. Consider the following questions:

- Does the supp[illegible]erial provide enough information to use the p[illegible]n effectively?
- Is the program designed specifically for special education students?
- What guarantees/warranties are included?
- What information is provided by the management system?
- Does it report accuracy level? Accuracy and number of attempts? A record of inaccurate responses?
- Does the program record lapses in student responding?
- Can student records be easily accessed?

Periodicals

The following periodicals regularly review software:

Closing The Gap, P.O. Box 68, Henderson, MN 56044.

The Computing Teacher, University of Oregon, 1787 Agate Street, Eugene, OR 97403.

Special Education Software Review, Drive One Publishers, Ltd. 3807 North Northwood Avenue, Peoria, IL 61614.

Teaching and Computers, Scholastic, Inc., P.O. Box 2040, Mahopac, NY 10541.

Public Domain Software Resource List

Better Software for Education, Box 161A, Route 1, Idaho Falls, ID, 83401.

Create, P.O. Box 8896, Green Bay, WI 94308.

Pandora Software, P.O. Box 55, Clearfield, UT 84015.

PC-Sig, 1125 Stewart Court, Suite G, Sunnyvale, CA 94086.

Public Domain Users Group, A-1 Computers, Inc., P.O. Box 1442, Orange Park, FL 32067.

Young Peoples' LOGO Association, P.O. Box 85507, Richardson, TX 75085.

Directories

Apple Computer Resources in Special Education and Rehabilitation, DLM Teaching Resources, One DLM Park, Allen, TX 75002, 214-248-6300; $19.95.

The 1989 Survey of Early Childhood Education, High/Scope Educational Research Foundation, 600 North River Street, Ypsilanti, MI 48198, 313-485-2000; $19.95.

The 1989 Closing The Gap Resource Directory, Closing The Gap, P.O. Box 68, Henderson, MN 56044, 612-248-3294, $21.95 + $2.00 shipping.

Only the Best: The Discriminating Guide for Preschool-Grade 12, Education News Service, P.O. Box 1789, Carmichael, CA 95609, 916-483-6159; $21.95 prepaid.

Software to Go, Software Evaluation Clearinghouse for Educators of the Hearing Impaired (SECHI), Gallaudet College, 7th and Florida Avenues, NE, Washington, DC 20002, 202-651-5043; $7.50 plus postage.

The SpecialWare Directory: A Guide to Software for Special Education, LINC Associates, Inc., 3857 North High Street, Columbus, OH 43214.

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Additional **Tech Use Guides** on the following topics are available from the Center upon request:

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Guide for Disabled Adults
Computer Access
Selecting Hardware
Preschool Children
Learning Disabilities
Hearing Impairments
Physical Disabilities
Visual Impairments
Telecommunication Networks
Augmentation Communication

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